

1    **2.20    Pavement Marking**

2    **2.20.1    General**

3           The Design-Builder shall perform all Work necessary to meet the requirements  
4           for permanent pavement markings for the Project.

5    **2.20.2    Mandatory Standards**

6           The following is a list of Mandatory Standards that shall be followed for all  
7           design and construction related to this Section as referenced in TR Section 2.2  
8           *Mandatory Standards.*

- 9           1. Special Provisions (Appendix 4)
- 10          2. Standard Specifications M 41-10 (Appendix 4)
- 11          3. WSDOT *Design Manual* M 22-01 (Appendix 4)
- 12          4. WSDOT *Standard Plans* M 21-01 (Appendix 4)
- 13          5. WSDOT *Traffic Manual* M 51-02 (Appendix 4)
- 14          6. *Washington State Modifications to the Manual on Uniform Traffic Control*  
15             *Devices* (WAC 468-95) (Appendix 4)
- 16          7. WSDOT *Materials Manual* M 46-01 (Appendix 4)
- 17          8. WSDOT *Construction Manual* M 41-01 (Appendix 4)
- 18          9. WSDOT *Plans Preparation Manual* M 22-31 (Appendix 4)
- 19          10. WSDOT *Maintenance Manual* M 51-01 (Appendix 4)
- 20          11. *Olympic Region Pavement Markings Policy* (Appendix 4)
- 21          12. *FHWA Manual on Uniform Traffic Control Devices for Streets and Highways*,  
22             2009 Edition with Revisions 1 & 2 dated May 2012 (Appendix 4)
- 23          13. *AASHTO A Policy on Geometric Design of Highways and Streets*
- 24          14. *AASHTO LRFD Specifications for Structural Supports for Highway Signs*,  
25             *Luminaires, and Traffic Signals*
- 26          15. *AASHTO Roadside Design Guide*
- 27          16. *Transportation Research Board Highway Capacity Manual*
- 28          17. *ITE Traffic Control Devices Handbook*
- 29          18. *FHWA Traffic Monitoring Guide*
- 30          19. *ITE Traffic Engineering Handbook*
- 31          20. *ITE Manual of Transportation Engineering Studies*

1           21. *Qualified Products List (QPL)*  
2           (<https://www.wsdot.wa.gov/Business/MaterialsLab/QPL.htm>)

3   **2.20.3     *Design and Construction Requirements***

4       **2.20.3.1   *Software***

5       The Design-Builder shall refer to TR Section 2.21, *Traffic Operations*, for traffic  
6       operations software requirements.

7       **2.20.3.2   *Pavement Markings Performance Requirements***

8       The Design-Builder shall ensure that all pavement markings on the Project meet  
9       the requirements of Section 8-22 of the Standard Specifications.

10      The Design-Builder shall test the retroreflective performance of newly applied  
11      pavement markings after 12 hours but within 21 Calendar Days of the marking  
12      application. The Design-Builder shall take 10 retroreflective readings per color  
13      line, evenly spaced, over a 2,000-foot roadway segment per mile for every 1-mile  
14      section over the length of the Project.

15      The Design-Builder shall ensure that the retroreflective pavement marking test  
16      methods and retroreflective performance meet the requirements in accordance  
17      with Section 9-34 of the Standard Specifications.

18      The Design-Builder shall prepare a written report summarizing all of the  
19      retroreflective performance test results and submit the report to the WSDOT  
20      Engineer within 7 Calendar Days of completing the field testing.

21      Any section of pavement marking that fails to satisfy the test criteria shall be  
22      replaced at no cost to WSDOT and retested to ensure it meets retroreflectivity  
23      criteria. The Design-Builder shall prepare a written report summarizing the  
24      retroreflective performance test results of the retested sections and shall submit  
25      the report to WSDOT Engineer within 7 Calendar days of completing the retested  
26      sections.

27      The Design-Builder shall ensure that the minimum retroreflectance values for the  
28      pavement markings as specified in the Standard Specifications and listed in these  
29      Technical Requirements are maintained until the Physical Completion of each  
30      respective Culvert Bundle.

31      **2.20.3.3   *Permanent Pavement Marking Design Requirements***

32      The Design-Builder shall prepare permanent Pavement Marking Plans that  
33      include, but are not limited to, all tapers, horizontal curve data, lane, shoulder,  
34      buffer widths, and the following marking elements:

- 35           • Center line striping  
36           • Edge line striping

- Lane line striping
- Wide lines
- Stop bars
- Arrows
- Legends
- Symbols
- Object markers and delineators
- Aerial surveillance markers
- Crosswalk lines
- Drainage markings
- Raised Pavement Markers (RPM)
- Any other markings consistent with the needs of the Project

The Pavement Marking Plans shall provide a basis for the pavement marking requirements for the Project. The Design-Builder shall be responsible for removing and replacing existing pavement marking in areas where temporary pavement markings will be used during construction.

Where new permanent pavement markings are required, all adjacent edge lines, center lines, lane lines, and wide lines shall also be replaced.

All striping and markings shall be in accordance with the Standard Plans and Standard Specifications.

#### **2.20.3.3.1 Additional Permanent Pavement Marking Requirements**

This Section was intentionally omitted.

#### **2.20.3.3.2 Permanent Pavement Marking Material Requirements**

The Design-Builder shall provide permanent pavement markings that meet the requirements of Section 9-34 of the Standard Specifications.

On arterial and local streets, the Design-Builder shall use pavement marking materials specified by the applicable Agency.

All permanent striping shall be in accordance with the *Olympic Region Pavement Markings Policy* (Appendix 4) except as otherwise noted in this Section. Paint is acceptable for use on this project for longitudinal lane and edge pavement markings, but all other markings shall be plastic. In other locations, painting shall be required where the Standard Plans or other guidelines refer to paint as “desirable.”

All Methyl Methacrylate markings shall be profiled in accordance with the Standard Plans except edge lines that are adjacent to shoulder rumble strips. Edge lines adjacent to shoulder rumble strips are not required to be profiled.

### 2.20.3.3 *Pavement Marking Material Certification*

The Design-Builder shall provide the WSDOT Engineer with a manufacturer's certification that the pavement marking material meets the requirements of Section 9-34 of the Standard Specifications. The Design-Builder shall ensure that the certification includes the manufacturer's address, telephone number, and contact person. The Design-Builder shall use materials from the QPL or provide a submittal for the proposed materials demonstrating compliance with Section 9-34 of the Standard Specifications and shall contain all supporting documentation and technical literature including previous testing, analysis, and field performance evaluations by an independent third party.

The Design-Builder shall provide the WSDOT Engineer with a copy of the manufacturer's application instructions.

### 2.20.3.4 *Permanent Pavement Marking Construction Requirements*

The Design-Builder shall not grind or blemish pavement after the final lift of pavement is applied. All pavement markings placed on the final lift of pavement shall be placed in their final location.

#### 2.20.3.4.1 *Equipment*

The Design-Builder shall use equipment as required by the manufacturer.

#### 2.20.3.4.2 *Surface Preparation*

If required, the Design-Builder shall remove any permanent or temporary pavement markings in accordance with the requirements of TR Section 2.22, *Maintenance of Traffic*, and Sections 8-22 and 8-23 of the Standard Specifications.

The Design-Builder shall prepare the pavement surface for the application of all pavement markings as recommended by the material manufacturer and in accordance with the requirements of Section 8-22 of the Standard Specifications. Grinding shall not be allowed after the final paving lift is complete.

#### 2.20.3.4.3 *Replacement of Unsatisfactory Pavement Markings*

The Design-Builder shall remove and replace pavement markings that meet any of the following criteria:

- Do not conform to the tolerances established under Section 8-22 of the Standard Specifications
- Fail to meet retroreflective performance as described in this Section
- Have visible drag marks, gashes, or gouges
- Contain foreign material covering the markings
- Have discolored areas

- Fail to solidify
- Do not adhere to the pavement
- Have areas with a ragged appearance, areas without sharply defined edges, or areas with abrupt unintended changes in alignment
- Have more than 10 percent of the substrate exposed in a running 2,000-foot section of longitudinal pavement marking line

## **2.20.4 Submittals**

### **2.20.4.1 Preliminary Design Submittal**

The Preliminary Pavement Marking Plans shall be submitted to the WSDOT Engineer for Review and Comment as part of the Preliminary Design Submittal.

The Pavement Marking Plans shall be prepared in accordance with the WSDOT *Plans Preparation Manual* and shall include the following:

- All existing pavement marking for a minimum of 300 feet past the limits of construction and temporary striping. Typical sections in lieu of Plans will not be accepted.
- All new pavement markings by material type, color, and line width. The Design-Builder shall dimension the pavement marking across the roadway completely, tying the pavement marking to a construction centerline or a monument line.
- Station and offset for all pavement arrows, symbols, and miscellaneous pavement markings.
- Station and offset for the beginning and ending of all pavement markings, and the beginning and ending of each taper and associated taper rates. The Design-Builder shall locate the beginning and ending points of all curves and the associated radii.
- Design drawings, other than the Standard Plans, that show details of pavement markings, tapers, and transitions.

The Pavement Marking Plans shall not be combined with the Paving Plans.

### **2.20.4.2 Final Design Submittal**

The Final Pavement Marking Plans shall be submitted to the WSDOT Engineer for Review and Comment as part of the Final Design Submittal.

### **2.20.4.3 Miscellaneous Submittals**

At the request of the WSDOT Engineer, the Design-Builder shall deliver to the WSDOT Engineer Work-related submittals that do not fit in the previous categories but are prepared in accordance with this Section.

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**End of Section**